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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,467	04/29/2005	Mats Dahlback	1026-0001WOUS	4111

49698 7590 07/03/2008

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EXAMINER
ROE, JESSEE RANDALL

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
07/03/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,467	DAHLBACK ET AL.	
	Examiner	Art Unit	
	Jessee Roe	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24,25,27-35 and 37-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24,25, 27-35 and 37-42* is/are rejected.

7)☐ Claim(s) *30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 24-25, 27-35 and 37-42 are pending wherein claims 24, 35 and 41 are amended and claims 1-23, 26 and 36 are canceled.

Status of Previous Rejections

The previous rejection of claims 24-25, 27-32, 35 and 37-38 under 35 U.S.C. 103(a) as being unpatentable over Van Swam et al. (US 5,844,959) is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 33-34 and 39-40 under 35 U.S.C. 103(a) as being unpatentable over Van Swam et al. (US 5,844,959) as applied to claim 24, with evidence from Easterday (Zirconium Analysis by Production Control Quantometer) is withdrawn in view of the Applicant's amendments to the claims. The previous rejections of claims 41-42 under 35 U.S.C. 103(a) as being unpatentable over Van Santen et al. (US 3,607,639) or Lorek et al. (US 5,323,434) in view of Van Swam et al. (US 5,844,959) are withdrawn in view of the Applicant's amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24-25, 27-29 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (US 4,718,949).

In regards to claims 24, 27-29 and 35, Takase et al. ('949) discloses a method of producing cladding tubes for nuclear reactor fuel that would be adapted for use in light-water reactors and heavy-water reactors of pressurized water type (col. 1, lines 11-21). Takase et al. ('949) discloses that the cladding tube would be cylindrical, as in claim 24 or generally cylindrical as in claim 35 (col. 5, lines 11-16 and Figs. 2-3). Takase et al. ('949) further discloses that the method would be applicable to a zirconium base alloy having 2.4 – 2.8 weight percent niobium (col. 4, lines 18-43). The Examiner notes that the composition disclosed by Takase et al. ('949) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed niobium content for a zirconium alloy from the amount of niobium in the zirconium alloy disclosed by Takase et al. ('949) because Takase et al. ('949) discloses the same utility throughout the disclosed range.

Still regarding claims 24, 27-29 and 35, although Takase et al. ('949) does not specify "wherein said final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%", Takase et al. ('949) discloses that the final anneal should be effected at 400°C to 610°C for a time period of less than 10 hours (col. 5, lines 1-5), which overlaps "wherein the final anneal is carried out at a temperature lower than 550°C." as recited in claim 27, "wherein the final anneal is carried out at a temperature which is between 400°C and about 540°C"

as recited in claim 28, and “wherein the final anneal is carried out during about 1h to about 6h" as recited in claim 29. Therefore, a degree of recrystallization in said tube component is higher than about 40% and lower than about 95% would be expected. MPEP 2112.01 I.

In regards to claim 25, Takase et al. (‘949) discloses cold rolling and annealing (heat treating) between the steps of formation and final annealing (Figs. 1a – 1c).

Claims 32 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (US 4,718,949) as applied to claims 24 and 35 above, and further in view of Murgatroyd et al. (US 3,271,205).

In regards to claims 32 and 38, Takase et al. ('949) discloses zirconium base alloys having 2.4 - 2.8 weight percent niobium, but Takase et al. ('949) does not specify that oxygen would be included in the alloy or adding oxygen to the zirconium-niobium alloy.

Murgatroyd et al. (‘205) discloses adding 1000 to 2000ppm oxygen, which overlaps the range of “between about 800ppm and about 1700ppm O”, to a zirconium base alloy containing 1 to 4 weight percent niobium in order to strengthen the alloy (col. 1, lines 30-64 and Figure 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added 1000 to 2000ppm oxygen, as disclosed by Murgatroyd et al. (‘205), to the zirconium-niobium alloy, as disclosed by Takase et al. (‘949), in order to strengthen the alloy, as disclosed by Murgatroyd et al. (‘205) (col. 1,

lines 30-64 and Figure 1).

Claims 33 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (US 4,718,949) as applied to claims 24 and 35 above, with evidence from Easterday (Zirconium Analysis by Production Control Quantometer).

In regards to claims 33 and 39, Takase et al. ('949) discloses a zirconium alloy as shown above, but Takase et al. ('949) does not specify the impurity elements of the zirconium alloy.

Easterday discloses that zirconium would contain 200-2000ppm iron impurity (Table I), which overlaps the claimed range of "between about 50ppm and about 600ppm Fe".

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Therefore, it would be expected that the zirconium of the zirconium-based alloy, as disclosed by Takase et al. ('949) would contain 200-2000ppm iron, as disclosed by Easterday, because Easterday discloses that zirconium would have this concentration of iron as an impurity (Table I).

Claims 41-42 are rejected under 35 U.S.C 103(a) as being unpatentable over Van Santen et al. (US 3,607,639) in view of Takase et al. (US 4,718,949).

In regards to claims 41-42, Van Santen et al. ('639) discloses a fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining fuel rods at suitable distances from each other, and guide tubes that extend between the top plate and bottom plate (col. 2, line 36 - col. 3, line 49). Van Santen ('639) further discloses that the tubes would be made of a zirconium alloy such as Zircaloy and the tubes would

contain UO_2 ceramic nuclear fuel (col. 2, lines 36-54). However, Van Santen ('639) does not specify all applicable zirconium alloy compositions.

Takase et al. ('949) discloses a method of forming zirconium alloy tubes wherein the tubes obtained (Zircaloy 2, Zircaloy 4, and Zr alloy having 2.4-2.8 weight percent Nb) would have excellent resistance to nodular corrosion (col. 4, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the zirconium alloy tubes, as disclosed by Van Santen et al. ('639), according to method of Takase et al. ('949), in order to have obtained zirconium alloy tubes that would have excellent resistance to nodular corrosion, as disclosed by Takase et al. ('949) (col. 4, lines 11-17).

Still regarding claim 41, Takase et al. ('949) discloses a method of producing cladding tubes for nuclear reactor fuel that would be adapted for use in light-water reactors and heavy-water reactors of pressurized water type (col. 1, lines 11-21). Takase et al. ('949) discloses that the cladding tube would be generally cylindrical (col. 5, lines 11-16 and Figs. 2-3). Takase et al. ('949) further discloses that the method would be applicable to a zirconium base alloy having 2.4 – 2.8 weight percent niobium (col. 4, lines 18-43). Although Takase et al. ('949) does not specify "wherein said final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%", Takase et al. ('949) discloses that the final anneal should be effected at 400°C to 610°C for a time period of less than 10 hours (col. 5, lines 1-5), which would be substantially similar to the process disclosed by the instant invention. Therefore, a degree of recrystallization in said tube component is

higher than about 40% and lower than about 95% would be expected. MPEP 2112.01 I.

Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorek et al. (US 5,323,434) in view of Takase et al. (US 4,718,949).

In regards to claims 41-42, Lorek et al. ('434) disclose a fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining the rods at suitable lateral distances from each other, and guide tubes that extend between the top plate and the bottom plate (col. 1, lines 6-20). Lorek et al. ('434) further specify that the tube would be made of a zirconium alloy and the tubes would contain UO_2 nuclear fuel for a nuclear water reactor (col. 1, lines 6-20 and col. 3, lines 29-52). However, Lorek et al. ('434) do not specify all possible zirconium alloy compositions that would be used for the tube.

Takase et al. ('949) discloses a method of forming zirconium alloy tubes wherein the tubes obtained (Zircaloy 2, Zircaloy 4, and Zr alloy having 2.4-2.8 weight percent Nb) would have excellent resistance to nodular corrosion (col. 4, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the zirconium alloy tubes, as disclosed by Lorek et al. ('434), according to method of Takase et al. ('949), in order to have obtained zirconium alloy tubes that would have excellent resistance to nodular corrosion, as disclosed by Takase et al. ('949) (col. 4, lines 11-17).

Still regarding claim 41, Takase et al. ('949) discloses a method of producing cladding tubes for nuclear reactor fuel that would be adapted for use in light-water

reactors and heavy-water reactors of pressurized water type (col. 1, lines 11-21). Takase et al. ('949) discloses that the cladding tube would be generally cylindrical (col. 5, lines 11-16 and Figs. 2-3). Takase et al. ('949) further discloses that the method would be applicable to a zirconium base alloy having 2.4 – 2.8 weight percent niobium (col. 4, lines 18-43). Although Takase et al. ('949) does not specify "wherein said final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%", Takase et al. ('949) discloses that the final anneal should be effected at 400°C to 610°C for a time period of less than 10 hours (col. 5, lines 1-5), which would be substantially similar to the process disclosed by the instant invention. Therefore, a degree of recrystallization in said tube component is higher than about 40% and lower than about 95% would be expected. MPEP 2112.01 I.

Claims 24, 27-29, 31, 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol (EP 0 198 570).

In regards to claims 24, 27-29, 31 and 35, Sabol (EP '570) discloses a method of producing thin-walled zirconium-niobium alloy tubing (abstract). Sabol (EP '570) further discloses that the zirconium alloys would contain 1 to 2.5 weight percent niobium as homogeneously dispersed finely divided particles (page 3, lines 16-23), which overlaps "wherein the Nb content in weight percent is between about 0.5 and about 2.4" in lines 5-6 of claim 24 and lines 3-4 of claim 35 and "wherein the Nb content in said alloy is between about 0.8 weight percent and about 1.2 weight percent" as in claims 31 and 37 and that the alloy would be formed into tubes having a diameter of 1.25 inches with a wall thickness of 0.16 inch (cylindrical, as in claim 24 or generally cylindrical as in claim

35) (page 5, lines 25-37). The Examiner notes that the composition disclosed by Sabol (EP ‘570) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed niobium content for a zirconium alloy from the amount of niobium in the zirconium alloy disclosed by Sabol (EP ‘570) because Sabol (EP ‘570) discloses the same utility throughout the disclosed range.

Still regarding claims 24, 27-29, 31 and 35, although Sabol (EP ‘570) does not specify "wherein said final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%", Sabol (EP ‘570) discloses final annealing at a temperature of about 427°C for a period of about 4 hours (claim 6), which reads on “wherein the final anneal is carried out at a temperature lower than 550°C.” as recited in claim 27, “wherein the final anneal is carried out at a temperature which is between 400°C and about 540°C” as recited in claim 28, and “wherein the final anneal is carried out during about 1h to about 6h" as recited in claim 29. Therefore, a degree of recrystallization in said tube component is higher than about 40% and lower than about 95% would be expected. MPEP 2112.01 I.

With respect to the recitation “for nuclear fuel for a nuclear pressure water reactor” as recited in lines 1-2 of claims 24 and 35, the Examiner notes that this recitation would not limit the structure of the cladding tube. Therefore, this recitation has been considered an intended use of the cladding tube. MPEP 2111.02 II.

Claims 32 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol (EP 0 198 570) as applied to claims 24 and 35 above, and further in view of Murgatroyd et al. (US 3,271,205).

In regards to claims 32 and 38, Sabol (EP '570) discloses zirconium base alloys having 1 to 2.5 weight percent niobium, but Sabol (EP '570) does not specify that oxygen would be included in the alloy or adding oxygen to the zirconium-niobium alloy.

Murgatroyd et al. ('205) discloses adding 1000 to 2000ppm oxygen, which overlaps the range of "between about 800ppm and about 1700ppm O", to a zirconium base alloy containing 1 to 4 weight percent niobium in order to strengthen the alloy (col. 1, lines 30-64 and Figure 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added 1000 to 2000ppm oxygen, as disclosed by Murgatroyd et al. ('205), to the zirconium-niobium alloy, as disclosed by Sabol (EP '570), in order to strengthen the alloy, as disclosed by Murgatroyd et al. ('205) (col. 1, lines 30-64 and Figure 1).

Claims 33 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over. Sabol (EP 0 198 570) as applied to claims 24 and 35 above, with evidence from Easterday (Zirconium Analysis by Production Control Quantometer)

In regards to claims 33 and 39, Sabol (EP 0 198 570) discloses a zirconium alloy as shown above, but Sabol (EP 0 198 570) does not specify the impurity elements of the zirconium alloy.

Easterday discloses that zirconium would contain 200-2000ppm iron impurity (Table I), which overlaps the claimed range of "between about 50ppm and about 600ppm Fe".

Therefore, it would be expected that the zirconium of the zirconium-based alloy, as disclosed by Sabol (EP 0 198 570) would contain 200-2000ppm iron, as disclosed by Easterday, because Easterday discloses that zirconium would have this concentration of iron as an impurity (Table I).

Claims 34 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol (EP 0 198 570) as applied to claims 24 and 35 above, with evidence from Easterday (Zirconium Analysis by Production Control Quantometer), and further in view of Murgatroyd et al. (US 3,271,205).

In regards to claims 34 and 40, Sabol (EP ‘570) discloses a zirconium base alloy having about 0.8 to about 1.2 weight percent niobium as shown above, but Sabol (EP ‘570) does not specify “about 50ppm to about 600ppm Fe, about 800ppm to about 1700ppm O, less than about 250ppm C, less than about 150ppm Si, less than about 100ppm S in addition to that only impurities of a content which does not exceed that which is normally accepted in Zr or Zr alloys for applications in nuclear reactors.”

Easterday discloses that zirconium would contain 200-2000ppm iron impurity and 20-600ppm silicon impurity (Table I), which overlaps the claimed range of "between about 50ppm and about 600ppm Fe".

Therefore, it would be expected that the zirconium of the zirconium-based alloy, as disclosed by Sabol (EP 0 198 570) would contain 200-2000ppm iron and 20-600ppm

silicon, as disclosed by Easterday, because Easterday discloses that zirconium would have this concentration of iron and silicon as impurities (Table I).

Murgatroyd et al. (‘205) discloses adding 1000 to 2000 ppm oxygen, which overlaps the range of “between about 800ppm and about 1700ppm O”, to a zirconium base alloy containing 1 to 4 weight percent niobium in order to strengthen the alloy (col. 1, lines 30-64 and Figure 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added 1000 to 2000ppm oxygen, as disclosed by Murgatroyd et al. (‘205), to the zirconium-niobium alloy, as disclosed by Sabol (EP ‘570) with evidence from Easterday, in order to strengthen the alloy, as disclosed by Murgatroyd et al. (‘205) (col. 1, lines 30-64 and Figure 1).

With respect to the recitations "less than about 250ppm C" and "less than 1000ppm S”, neither Sabol (EP '570), Murgatroyd et al. ('205) nor Easterday necessitate adding carbon or sulfur. Therefore, Sabol (EP ‘570), Murgatroyd et al. (‘205) and Easterday would meet these limitations because “less than” would include 0ppm.

Claims 41-42 are rejected under 35 U.S.C 103(a) as being unpatentable over Van Santen et al. (US 3,607,639) in view of Sabol (EP 0 198 570).

In regards to claims 41-42, Van Santen et al. (‘639) discloses a fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining fuel rods at suitable distances from each other, and guide tubes that extend between the top plate and bottom plate (col. 2, line 36 - col. 3, line 49). Van Santen ('639) further discloses that the tubes would be made of a zirconium alloy such as Zircaloy and the tubes would

contain UO_2 ceramic nuclear fuel (col. 2, lines 36-54). However, Van Santen ('639) does not specify all applicable zirconium alloy compositions.

Sabol (EP '570) discloses forming zirconium alloy tubes having 1 to 2.5 weight percent niobium having excellent corrosion resistance (abstract and page 3, lines 16-23)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the zirconium alloy tubes, as disclosed by Van Santen et al. ('639), according to method of Sabol (EP '570), in order to have obtained zirconium alloy tubes that would have excellent corrosion resistance, as disclosed by Sabol (EP '570) (abstract).

Still regarding claim 41, Sabol (EP '570) discloses a method of producing thin-walled zirconium-niobium alloy tubing (abstract). Sabol (EP '570) further discloses that the zirconium alloys would contain 1 to 2.5 weight percent niobium as homogeneously dispersed finely divided particles (page 3, lines 16-23), and that the alloy would be formed into tubes having a diameter of 1.25 inches with a wall thickness of 0.16 inch (cylindrical, as in claim 24 or generally cylindrical as in claim 35) (page 5, lines 25-37). The Examiner notes that the composition disclosed by Sabol (EP '570) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed niobium content for a zirconium alloy from the amount of niobium in the zirconium alloy disclosed by Sabol (EP '570) because Sabol (EP '570) discloses the same utility throughout the disclosed

range.

Still regarding claim 41, although Sabol (EP ‘570) does not specify "wherein said final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%", Sabol (EP ‘570) discloses final annealing at a temperature of about 427°C for a period of about 4 hours (claim 6), which would be substantially similar to the process disclosed by the instant invention. Therefore, a degree of recrystallization in said tube component is higher than about 40% and lower than about 95% would be expected. MPEP 2112.01 I.

With respect to the recitation “for a nuclear pressure water reactor” of claim 41, the Examiner notes that this recitation would not limit the structure of the fuel assembly and therefore has been considered an intended use of the fuel assembly. MPEP 2111.02 II.

Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorek et al. (US 5,323,434) in view of Sabol (EP 0 198 570).

In regards to claims 41-42, Lorek et al. (‘434) disclose a fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining the rods at suitable lateral distances from each other, and guide tubes that extend between the top plate and the bottom plate (col. 1, lines 6-20). Lorek et al. (‘434) further specify that the tube would be made of a zirconium alloy and the tubes would contain UO_2 nuclear fuel for a nuclear water reactor (col. 1, lines 6-20 and col. 3, lines 29-52). However, Lorek et al. (‘434) do not specify all possible zirconium alloy compositions

that would be used for the tube.

Sabol (EP ‘570) discloses forming zirconium alloy tubes having 1 to 2.5 weight percent niobium having excellent corrosion resistance (abstract and page 3, lines 16-23)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the zirconium alloy tubes, as disclosed by Lorek et al. (‘434), according to method of Sabol (EP ‘570), in order to have obtained zirconium alloy tubes that would have excellent corrosion resistance, as disclosed by Sabol (EP ‘570) (abstract).

Still regarding claim 41, Sabol (EP ‘570) discloses a method of producing thin-walled zirconium-niobium alloy tubing (abstract). Sabol (EP ‘570) further discloses that the zirconium alloys would contain 1 to 2.5 weight percent niobium as homogeneously dispersed finely divided particles (page 3, lines 16-23), and that the alloy would be formed into tubes having a diameter of 1.25 inches with a wall thickness of 0.16 inch (cylindrical, as in claim 24 or generally cylindrical as in claim 35) (page 5, lines 25-37). The Examiner notes that the composition disclosed by Sabol (EP ‘570) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed niobium content for a zirconium alloy from the amount of niobium in the zirconium alloy disclosed by Sabol (EP ‘570) because Sabol (EP ‘570) discloses the same utility throughout the disclosed range.

Still regarding claim 41, although Sabol (EP ‘570) does not specify "wherein said

final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%", Sabol (EP '570) discloses final annealing at a temperature of about 427°C for a period of about 4 hours (claim 6), which would be substantially similar to the process disclosed by the instant invention. Therefore, a degree of recrystallization in said tube component is higher than about 40% and lower than about 95% would be expected. MPEP 2112.01 I.

With respect to the recitation "for a nuclear pressure water reactor" of claim 41, the Examiner notes that this recitation would not limit the structure of the fuel assembly and therefore has been considered an intended use of the fuel assembly. MPEP 2111.02 II.

Allowable Subject Matter

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claim 30, Takase et al. ('949) (Example 2) discloses hot extruding to form the zirconium-niobium alloy tube. Likewise, Sabol (EP '570) discloses extruding a billet to form a tube (page 5, lines 11-37). Thus, the prior art does not disclose or suggest a method of producing a zirconium-niobium alloy cladding tube having between about 0.5 and about 2.4 weight percent niobium and not more than about 0.2 weight percent of additional alloying elements other than niobium and zirconium wherein the

zirconium based alloy would be cold rolled from the billet shape into the tube shape in at least two steps with heat treatments at between 550°C and about 650°C.

Response to Arguments

Applicant's arguments with respect to claims 24-25, 27-35 and 37-42 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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JR